Chapter 8: Predicting Outcome Measures

In Chapters 4 through 7 we described the conditions of confinement experienced by residents of juvenile facilities. In this chapter we present multivariate regression models that relate certain conditions of confinement to the incidence of five types of events: searches, isolation, suicidal behaviors, interpersonally caused injuries, and escapes.

We use multivariate analysis in order to avoid confounding the effects of conditions of confinement with the effects of other factors, such as the characteristics of confined juveniles. For example, if facilities with frequent counts also tend to have more extensive hardware security, then an analysis of the impact of performing counts on the escape rate that did not include proper controls for hardware security would run the risk of attributing the effects of hardware security to more frequent counts. On the other hand, if facilities used more frequent counts in an attempt to make up for the absence of hardware, an analysis that did not take into account hardware security could substantially underestimate the effects of more frequent counts.

While we believe that the regressions do provide some useful evidence concerning the importance of certain conditions for juvenile well-being, three cautions should be kept in mind. First, we are considering only five types of outcomes, although they are serious ones. While factors that affect these outcomes are clearly important, factors that do not affect them may well be important for other reasons. For example, we have no measures of the effectiveness of treatment or education in juvenile facilities. Nor would it be reasonable to require that conditions induce escapes, violence, or suicidal behavior before they become matters of concern. Second, conditions in facilities are often highly correlated. Sometimes we can fairly definitely conclude that there is or is not an association between some conditions and rates of suicidal behavior, violence, or escapes. In other cases, the data simply do not allow us to sort out the effects of separate factors. Unless specifically noted, the lack of a statistically significant relationship should not be taken to mean that none exists.

Finally, we cannot claim to have captured all of the factors of importance: It is clear that there is substantial variance in outcome rates across facilities which is not explained in our models. Observed relationships may still reflect the effects of omitted variables.

Outcome Measures

Our five outcome measures were defined from information on incidents reported in the mail survey.

Searches. Searches uncover and help to eliminate contraband, thereby improving security and safety. The mail survey asked for the number of times the following types of searches were performed in the past month: room searches, frisks and patdowns, strip searches, body cavity searches, and drug tests. Room searches and frisks are conducted routinely in the majority of facilities, while body cavity searches and drug tests are conducted infrequently, if ever, in most facilities (see Chapter 7B, Limits on Staff Discretion).[1]

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[1] Several of the outcome variables, including searches, have highly skewed distributions. During preliminary analyses we found that a few outliers were strongly influencing the regressions. These outliers were excluded from the final analyses presented in this chapter.

Rates were calculated for each type of search. During earlier analyses for this chapter, each search rate was analyzed independently. Later analyses collapsed the searches into two categories: invasive searches (a sum of the strip search, body cavity search, and drug test rates) and noninvasive searches (a sum of the room search and frisk rates). We found little difference in the explanatory models predicting invasive and noninvasive searches, causing us to consider all searches combined in the final analysis. Our final measure is the total rate of all searches performed during the month prior to the mail survey per 100 juveniles.

Isolation. Isolation is frequently used as a means of managing juvenile behavior. In Chapter 7B, we make the distinction between isolation for 24 hours or less and isolation for more than 24 hours. A rate is computed for the number of times each category of isolation has been used in the month prior to the mail survey. Both isolation rates are examined in this chapter.

We predict search rates and isolation rates using the explanatory variables described below. However, these rates also constitute conditions of confinement and are used to predict the other outcome rates, such as injuries and escapes. The total search rate and isolation rates (under 24 hours and over 24 hours) are included in the regressions of the other outcome measures.

Suicidal Behaviors. The mail survey asked facilities for the number of suicide attempts, suicidal gestures, and self-mutilations in the month prior to the survey. A suicidal behavior rate per 100 juveniles was calculated using these facility reports by dividing the number of suicidal behaviors by the population in the facility at the time of the survey. Suicidal behavior is not an unusual occurrence in juvenile facilities, but most facilities do not experience high rates of such behavior. In Chapter 5B, Controlling Suicidal Behavior, we discuss rates of suicidal behavior and suicide prevention strategies. These prevention strategies will be discussed briefly below under "relevant assessment criteria" (see Chapter 5B for more detail).

Injuries. Juveniles may be injured by other juveniles during fights. Juveniles and staff may also injure each other during fights or when a staff member uses force to restrain a juvenile. The mail survey asked facilities for the number of times juveniles and staff had been injured by each other in the previous month. Rates for juvenile-on-juvenile injuries and staff-on-juvenile injuries per 100 juveniles are computed by dividing the number of incidents by the population at the time of the survey. The rate of juvenile-on-staff injuries per 100 staff persons is computed by dividing the number of incidents by the number of staff at the time of the survey. (See Chapter 5A, Security, for more description of these injury rates.) All three injury rates are considered in this chapter.

Escapes. Facilities also reported the number of unsuccessful and completed escapes in the mail survey. The escape rate in this chapter is computed by dividing the number of completed escapes by the juvenile population. The attempted escape rate analyzed in this chapter is computed by summing the total number of unsuccessful and completed escapes and dividing that sum by the juvenile population.[2] This measure reflects all attempts to escape, regardless of outcome.

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[2] The attempted escape rate here differs from the rate used in Chapter 5A, which included only unsuccessful escapes.

Explanatory Variables

Three types of explanatory variables are included in our multivariate analyses: juvenile population characteristics, basic facility characteristics, and relevant assessment criteria.

Juvenile Population Characteristics. We would expect that injury, suicidal behavior, and escape rates would be related to the characteristics of the confined population. For example, facilities with older juveniles and delinquent offenders charged with violent or drug distribution offenses may have higher injury rates. We attempt to control for these effects using five variables which measure the percentage of juveniles who are: male, 16 years of age or older, nonwhite, held for crimes against persons, or held for drug-related offenses. An additional measure of the characteristics of the juvenile population measures the range in age between the youngest and oldest residents. All of these measures are based on 1991 CIC census data.[3]

Facility Characteristics. Here we discuss the type of facility, public or private ownership, region, hardware security, facility size, the percentage of juveniles housed in single rooms, the percentage of juveniles housed in dormitories, and a measure of turnover in the juvenile population.

Throughout the report we highlight differences in conditions of confinement by facility type. Facility type is also one of the primary variables in this chapter. Here it is measured using dichotomous variables to indicate whether the facility is a training school, detention center, or ranch. (We eliminated reception centers because there were too few of them to perform meaningful analysis.)

Dichotomous variables are also used to measure the type of ownership, region, security features, and population size. Ownership is measured by a variable that indicates if a facility is privately, rather than publicly, owned. Three dichotomous variables indicate the region in which a facility is located (Northeast, Midwest, or West, leaving South as the comparison region). We measure the degree of hardware security using two dichotomous variables that indicate the presence of a 12-foot fence or wall and a practice of keeping living units locked 24-hours a day.[4] Facility size is measured using a dichotomous variable to indicate that the facility has a population of 1 to 50 residents. This variable allows us to determine whether facilities that have 50 or fewer residents experience lower rates of injuries or other adverse outcomes, suggesting that they are safer than larger facilities.

Juveniles in dorm rooms may be less safe from physical injury than those in individual rooms, due to increased social density and reduced staff ability to observe all activity in dormitories. In response to this concern, we include a variable that measures the percentage of juveniles in a facility who sleep in rooms with 11 or more juveniles.

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[3] In this chapter the term "minority" refers to any juvenile of black, Hispanic, Native American, or Asian heritage.

[4] A strong warning is in order here regarding ranches. There are only a handful of ranches with these hardware security features, making any estimates of the effect of these features extremely unreliable for that facility type.

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However, juveniles in multiple-occupancy rooms may be less likely than those in individual rooms to attempt suicidal behavior. Individual rooms provide juveniles with a safer environment in terms of interpersonal violence but also isolate them from each other at night, giving juveniles more opportunities to harm themselves. In the regression of the suicidal behavior rate, a variable which measures the percent of juveniles sleeping in single rooms is substituted for the variable measuring the percent of juveniles sleeping in dorms.

Juveniles are believed to be more likely to attempt suicide when they have first been admitted, and many facilities search juveniles each time they enter the facility. High turnover should therefore increase the rates of these behaviors. We found higher suicidal behavior rates (see Chapter 5B) and higher search rates (see Chapter 7B) in detention centers and felt that the higher turnover in these types of facilities might be contributing to the higher suicidal behavior and search rates. To control for this effect, a measure of population turnover is included in the regressions. Turnover is measured as the number of admissions per person-month in the facility and is calculated as the inverse of the average length of stay.

Accreditation by ACA is included as an explanatory variable in the regressions. ACA provided a list of the facilities that were accredited at the time of our study—this list was merged with the CIC census and mail survey data for these analyses. At the time of the study only detention centers and training schools were accredited by ACA. Therefore, no results are presented for this variable for ranches.

Relevant Assessment Criteria. Whenever possible in Chapters 4 through 7, we provided some indication of the impact of conformance to assessment criteria on various behavioral outcomes. In this chapter, we extend those analyses and examine the impact of conformance to relevant assessment criteria, while taking into account the facility and juvenile characteristics just described. There is at least one relevant assessment criterion for each of the five types of behavioral rates included in this chapter. Dichotomous variables indicate conformance to each assessment criterion.

a)   Staffing

In Chapter 5A, we discussed supervision staff ratios calculated using data from the CIC census. Here we explore the relationship between supervision staff ratios and incidence rates. For the purposes of these analyses, we have created a dichotomous variable based upon the continuous supervision staff ratio presented in Chapter 5A. This measure indicates if a facility meets the supervision staffing ratio discussed in the ACA standards.[5]

In addition to the staffing ratio criterion, a supervision staff turnover rate is included in the model. We computed the rate of supervision staff turnover by dividing the number of employees who left or lost their jobs in the year prior to the mail survey by the number of supervision staff reported on the 1991 CIC census (see Chapter 5A for turnover rates).

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[5] The discussion in the ACA standards recommends a staffing ratio of 1:8 during daytime shifts and 1:16 during the night shift. See Chapter 5A for our method of computing the security staff-to-juvenile ratio.

The counseling staff ratio presented in Chapter 6C is also included in the model. This counseling measure indicates if a facility meets the recommended ACA ratio of 1 counseling staff member per 25 juveniles.

b)   Crowding

Crowded facilities may experience more stress than uncrowded facilities, which may in turn lead to a less safe living environment. We test this hypothesis using the crowding assessment criteria presented in Chapter 4A, Living Space.

A facility may be crowded in three ways: if the population exceeds the reported design capacity, if any juveniles are confined in sleeping rooms which do not meet the recommended square footage, or if any living unit contains more than 25 juveniles. Each of these assessment criteria indicate if there is some crowding in the facility, but they are conservative indicators, because they include some facilities which may be only slightly crowded. (See Chapter 4A for a detailed description of these assessment criteria.)

During the development of the explanatory model, we tried many different ways to measure crowding, including both dichotomous and continuous measures (such as the percentage of juveniles estimated to be in crowded sleeping rooms). In the end, we decided to use these measures in dichotomous form: each measure indicates if a facility is in conformance with a particular crowding criterion. Although we are unable to estimate the effects of severe crowding using these criteria (as all crowded facilities are grouped together, regardless of the degree of crowding), these measures allow us to test for the association of any crowding with the outcome measures of interest.

c)   Searches

The search assessment criterion recommends that searches be conducted only with the specific approval of the facility administrator. In Chapter 7B, we found that facilities conforming to the searches assessment criterion had lower search rates.

d)   Isolation

Two assessment criteria regarding isolation are presented in Chapter 7B. The first recommends that facilities not isolate juveniles for more than 5 continuous days. The second requires a written report each time a juvenile is isolated or confined for more than 1 hour. We expect that conformance to each of these criteria will be associated with lower isolation rates.

e)   Suicide Prevention

In Chapter 5B we examined conformance to four suicide prevention assessment criteria: having a written suicide prevention plan, conducting suicide screening upon admission to the facility, conducting suicide prevention training for supervision staff, and constant monitoring of juveniles deemed to be suicide risks. Dichotomous variables indicating conformance to each of these four criteria are included in the regression of the suicide behavior rate.

f)   Classification

Effective classification procedures are expected to protect the personal safety of both juveniles and facility staff. We test the hypothesis that conformance to the criterion recommending a written classification plan or procedure which is used to assess risk and make housing decisions would be associated with decreases in the rates of all three types of injury.

g)   Use of Force and Restraints

Conformance to the criteria for use of force and use of restraint presented in Chapter 7B may discourage staff from physically restraining juveniles, thereby decreasing the rate of juvenile-on-staff and staff-on-juvenile injuries. The criterion for use of restraint recommends that staff complete a written report each time physical restraints are used, increasing staff accountability. The criterion for use of force also requires a written report and specifies that force may only be used in instances where there is potential for physical injury to staff or residents, damage to the facility, or for escape from the facility.

h)   Institutional Counts

We test the hypothesis that the criterion recommending three institutional counts per day would be associated with decreases in the attempted and completed escape rates (see Chapter 5A for conformance with this criterion). Facilities having strong procedures for counting juveniles throughout the day should have fewer escapes.

Methods

Five types of rates were discussed above: searches, isolation (short-term and long-term), suicidal behaviors, injuries (juvenile-on-juvenile, juvenile-on-staff, and staff-on-juvenile), and escapes (attempted and completed). Each of the nine rates was regressed on the explanatory variables presented, using weighted least squares regression. As in the rest of this report, all analyses are weighted by the juvenile population, to represent the experience of confined juveniles. The weighting takes into account the more precise estimates of rates afforded by larger facility populations.[6]

In earlier regression analyses, we attempted to pool all three facility types into one regression equation predicting each of the rates.[7] After examining the results separately by facility type, we found that the amount of variation in the outcome rates differed too much by facility type to justify a pooled model. Therefore, all of the regression analyses presented in this chapter were performed by facility type, using interaction variables.

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[6] Although the rates often appear to be proportions, we used linear regressions. We did this for several reasons. First, some of the rates are not in fact probabilities and need not lie between zero and one. Second, some institutions have observed rates of zero, and some probably have actual rates of zero. This makes the use of conventional logistic or probit transformations problematic. We felt that an arc sine transformation, while useful in such situations, would be too unfamiliar to be effective.

[7] Reception centers are excluded from the regression analyses, due to the very small number of facilities of that type.

Three interaction variables were created for each main explanatory variable of interest, by multiplying the original main variable by three dichotomous variables that measured the type of facility. The first three columns of each table present the regression coefficient (and standard error) for each of the interacted explanatory variables. These coefficients are the results of a fully interacted model; they show the expected increase or decrease in the average of the dependent variable associated with a unit change in each explanatory variable, for each of the three facility types.

The fourth through eighth columns present the results of various F tests performed to test the statistical significance of sets of variables in the model. In the fourth column we present the results of a test showing that the explanatory variable has no effect in any of the three facility types. This test serves as our decision rule regarding the results discussed. If this test is significant, then we state that there is a significant relationship between the explanatory variable and the dependent variable. If this null hypothesis is not rejected, effects in separate facility types are not discussed, even though the individual coefficients may appear to be significantly different from zero, because most such differences are spurious.

The fifth column contains the results of F tests which indicate if the detention center and ranch interaction variables make a significant contribution to the model, above and beyond the contribution of the main explanatory variable. Training schools are the omitted category in this test, so the results tell us if results in detention centers and ranches make an additional contribution to the equations.

The sixth through eighth columns present the results of F tests which indicate if the coefficients for each pair of facility types are significantly different from one another. The sixth column compares detention centers to ranches, the seventh column compares training schools to ranches, and the eighth column compares detention centers to training schools. These columns are particularly helpful in interpreting the significance of the individual coefficients by facility type.

In several instances we found that the main explanatory variable and the two interaction variables combined made a significant contribution to the model (thereby passing our decision rule for statistical significance in the model), yet only one of the facility-specific coefficients is found to be statistically significant. Using these F tests, we can tell if the facility-specific coefficients are statistically different from one another. If they are not statistically different from one another, we may be able to make some limited inferences across facility type.

One table has been produced for each of the nine outcome rates: the complete regression model is presented for each rate, regardless of the significance of the individual coefficients. As a general rule, we will only discuss results which pass our decision rule of a significant F test for the main explanatory variable and the two interaction variables combined. Although we include juvenile population characteristics and basic facility characteristics such as region in the model, we do not focus on these variables in the text. Instead, we focus primarily upon the conditions of confinement (such as hardware security, living arrangements, and assessment criteria) which we expect to be related to the outcome measures.

Results

Searches. Most of the significant findings regarding searches are for detention centers, and most of our discussion of search rates will focus on detention centers, although other notable findings will be highlighted briefly.

In Chapter 7B we presented the distribution of search rates and noted that the search rate for detention centers was significantly higher than that for training schools and ranches. We hypothesized that detention centers have higher rates of searches because they have more admissions, and many facilities routinely search juveniles upon admission. This hypothesis is supported by the regression results presented in Table 8-1. Detention centers do not have a significantly higher search rate than training schools once we control for admissions.

Table 8-1
Regression of Total Search Rate on Facility Characteristics

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Intercept	-28.984 (13.700)	49.779 (27.492)	17.058 (55.915)					
Percent male	0.009 (0.068)	0.099 (0.242)	-0.044 (0.251)	0.0718	0.0905	0.1677	0.0409	0.1290
Percent minority	0.117 (0.086)	-0.159 (0.118)	0.168 (0.300)	1.3298	1.9034	1.0314	0.0272	3.5798
Percent aged 16 or older	0.076 (0.078)	0.038 (0.154)	0.032 (0.212)	0.3386	0.0363	0.0005	0.0370	0.0468
Age range	1.887 (1.284)	-2.423 (1.472)	0.484 (3.116)	1.6317	2.4450	0.7119	0.1733	4.8702*
Percent serious offenses	0.134 (0.108)	0.463* (0.198)	-0.221 (0.686)	2.3845	1.2614	0.9195	0.2620	2.1358
Percent drug offenses	0.573* (0.261)	-0.134 (0.364)	-0.170 (0.809)	1.6627	1.4246	0.0016	0.7623	2.4886
Population < 50 residents	5.937 (6.073)	-18.665* (6.315)	4.044 (13.250)	3.2616*	4.1958*	2.3938	0.0169	7.8854*
Private	-1.309 (6.160)	-10.619 (17.852)	0.628 (19.934)	1.333	0.1315	0.1769	0.0086	0.2430
West	1.924 (4.899)	-0.029 (7.223)	2.385 (15.804)	0.0590	0.0272	0.0193	0.0008	0.0501
Northeast	-3.899 (5.470)	18.512* (8.881)	4.236 (21.386)	1.6308	2.3123	0.3801	0.1358	4.6164*
Midwest	-4.181 (4.835)	4.333 (6.236)	-0.267 (15.862)	0.4103	0.5830	0.0728	0.0557	1.1641
Percent in single rooms	0.029 (0.048)	0.065 (0.246)	-0.027 (0.156)	0.1550	0.0723	0.0998	0.1181	0.0206
Admissions per person-month	-27.890* (10.149)	6.583* (1.614)	10.503 (29.542)	8.1048*	5.6398*	0.0176	1.5107	11.2536*
ACA accreditation	-4.687 (5.372)	12.708 (7.562)	(a)	1.7929	3.5172	(a)	(a)	3.5172

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Explanatory Variables	Regression Coefficients (standard error)			F tests				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Locked living units	1.484 (3.962)	12.529 (6.491)	-11.943 (29.923)	1.3417	1.2035	0.6388	0.1979	2.1095
12-foot wall or fence	6.568 (4.582)	-12.871* (5.088)	-12.355 (66.802)	2.8294*	4.0420*	0.0001	0.0799	8.0606*
Classification	8.801* (3.578)	1.614 (5.740)	1.140 (10.519)	2.0470	0.6977	0.0016	0.4754	1.1291
Security staff ratio criterion	-6.386 (3.905)	-0.292 (5.046)	0.763 (16.703)	0.8930	0.4971	0.0037	0.1737	0.9121
Staff turnover rate	0.216* (0.107)	-0.131 (0.143)	0.028 (0.208)	1.6314	1.9213	0.3967	0.6408	3.7664
Counseling staff ratio criterion	9.789 (7.343)	-18.938* (4.590)	1.588 (13.856)	6.2710*	5.8772*	1.9776	0.2735	11.0055*
Living unit size criterion	-0.272 (0.661)	1.723* (0.781)	-0.039 (4.737)	1.6776	1.9076	0.1347	0.0024	3.7994
Facility exceeds design capacity	-2.967 (3.377)	-10.862* (5.020)	2.951 (12.440)	1.8366	1.0672	1.0603	0.2108	1.7027
Minimum room size criterion	6.667* (3.416)	-0.461 (4.634)	-1.740 (11.802)	1.3657	0.9388	0.0102	0.4931	1.6291
Short-term isolation rate	-0.035 (0.022)	0.070* (0.014)	0.217 (0.916)	9.5890*	8.3680*	0.0255	0.0755	16.6990*
Long-term isolation rate	-0.099 (0.116)	0.062 (0.088)	0.138 (0.925)	0.4164	0.6230	0.0068	0.0650	1.2248
Search criterion	-5.039 (4.821)	-8.206 (10.654)	-3.560 (14.247)	0.5827	0.0458	0.0682	0.0097	0.0734

R-square = 24% (a) = not applicable
DF = 485 * = differences are statistically significant at the .05 level
F = 2.966, p = .0001

In detention centers it appears that higher levels of hardware security are associated with lower total search rates.[8] The total search rate is lower in facilities with a 12-foot wall or fence. Facilities with more frequent searches are more likely to use short-term isolation.

Smaller detention centers rely less on searches to maintain institutional safety. Detention centers that conformed to the treatment staffing ratio relied less on searches to ensure safety and control than those that did not conform.

The regressions are inconclusive with respect to the effect of requiring administrative approval for searches. After taking into account facility and population characteristics, conformance to the assessment criterion recommending administrator approval of all searches is not significantly associated with a lower search rate.
Although there is a negative estimated effect for all three facility types, the standard errors for these coefficients are large.

Isolation. The regression results for isolation under 24 hours are presented in Table 8–2. Detention centers have higher rates of short-term isolation than training schools and ranches. As with the search rate, our model seems to identify more associations for detention centers than for the other two facility types.

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[8] For each result discussed, we found an overall association between the explanatory variable and the search rate. However, each association was statistically significant for either detention centers or training schools only, and the coefficients for detention centers and training schools were significantly different from each other in each instance.

Table 8–2
Regression of Rate of Isolation Under 24 Hours on Facility Characteristics

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Intercept	74.660 (60.160)	374.216* (104.714)	-32.297 (181.127)					
Percent male	0.196 (0.194)	-0.352 (0.718)	0.012 (0.516)	0.4204	0.3069	0.1704	0.1105	0.5432
Percent minority	-0.110 (0.294)	-0.362 (0.359)	-0.024 (0.935)	0.3854	0.1661	0.1140	0.0078	0.2941
Percent aged 16 or older	-0.134 (0.239)	-0.321 (0.509)	0.008 (0.507)	0.2382	0.1063	0.2101	0.0644	0.1105
Age range	0.171 (3.919)	1.654 (5.355)	-0.051 (7.604)	0.0324	0.0290	0.0336	0.0007	0.0499
Percent serious offenses	-0.143 (0.335)	0.768 (0.676)	-0.008 (1.964)	0.4919	0.7305	0.1398	0.0046	1.4605
Percent drug offenses	1.288 (0.873)	2.195 (1.277)	0.005 (2.243)	1.7104	0.3946	0.7200	0.2838	0.3443
Population < 50 residents	2.136 (17.548)	25.022 (21.500)	-0.133 (40.616)	0.4565	0.3756	0.2996	0.0026	0.6801
Private	-22.559 (16.932)	-16.832 (46.913)	-0.388 (44.661)	0.6861	0.4812	0.3525	0.0078	0.0132
West	5.386 (15.911)	31.348 (22.488)	1.111 (45.691)	6.9255*	5.2060*	4.0055*	0.1460	0.8882
Northeast	-23.470 (16.470)	-131.535* (30.380)	-0.411 (58.047)	3.2505*	1.2088	1.4388	0.2537	9.7788*
Midwest	-22.979 (14.256)	-58.750* (21.966)	0.379 (44.132)	0.6347	0.1095	0.0644	0.2155	1.8660
Percent in dormitories	-0.106 (0.154)	2.271* (0.753)	-0.001 (0.379)	3.1860*	4.7769*	7.2597*	0.0660	9.5534*
Admissions per person-month	-57.437 (33.099)	-8.848 (4.991)	-0.160 (82.661)	2.0513	1.0605	0.0110	0.4138	2.1071
ACA accreditation	-6.252 (14.950)	-69.446* (27.279)	(a)	3.3279*	4.1270*	(a)	(a)	4.1270*
Locked living units	-0.791 (11.363)	-29.513 (21.201)	4.830 (80.464)	0.6488	0.7239	0.1703	0.0048	1.4259

Explanatory Variables	Regression Coefficients (standard error)			F tests				
	Training Schools	Detention Centers	Ranches	Any Effect	Differences by Facility Type			
					Any	DC=R	TS=R	DC=TS
12-foot wall or fence	12.063 (14.845)	-7.786 (16.818)	28.597 (141.191)	0.3052	0.4073	0.0655	0.0136	0.7829
Classification	10.603 (11.402)	-29.980 (18.266)	-0.551 (26.348)	1.1863	1.7761	0.8426	0.1509	3.5521
Security staff ratio criterion	-7.878 (11.781)	-15.886 (15.638)	-0.134 (39.070)	0.4930	0.1187	0.1401	0.0360	0.1673
Staff turnover rate	0.201 (0.327)	3.080* (0.394)	0.007 (0.541)	20.5329*	18.4567*	21.0808*	0.0942	31.6488*
Counseling staff ratio criterion	56.479* (23.478)	44.539* (14.628)	0.065 (39.152)	5.0192*	0.7707	1.1323	1.5270	0.1863
Living unit size criterion	-5.183* (1.905)	-0.668 (2.900)	0.508 (12.628)	2.4860	0.9043	0.0082	0.1986	1.6928
Facility exceeds design capacity	13.431 (10.208)	60.293* (15.572)	0.723 (35.031)	5.5744*	3.4433*	2.4146	0.1213	6.3344*
Minimum room size criterion	-5.768 (11.133)	-14.161 (14.693)	0.246 (31.492)	0.3991	0.1421	0.1719	0.0324	0.2073
Total search rate	-0.425 (0.229)	0.837* (0.202)	-0.056 (3.280)	6.8923*	8.5618*	0.0739	0.0126	17.1127*
Time limit criterion	-21.995 (15.605)	-182.212* (18.806)	-0.760 (91.914)	31.9548*	21.9278*	3.7407	0.0519	42.9834*
Written report criterion	-68.816 (40.303)	-216.892* (27.991)	12.403 (117.203)	20.9895*	5.7028*	3.6210	0.4294	9.1062*

R-square = 62%   (a) = not applicable
DF = 450   * = differences are statistically significant at the .05 level
F = 9.741, p = .0001

Detention centers operating over their design capacity have higher rates of short-term isolation.

Meeting the supervision staffing ratio does not have a large or significant effect on isolation rates, but staff turnover is associated with an increase in the short-term isolation rate among detention centers. The percentage of juveniles housed in dormitories is also positively related to short-term isolation rates

in detention centers. Social density increases the chances of interpersonal conflict, and staff may rely more on short-term isolation to maintain control in facilities with dormitories and in crowded facilities.

Conformance to the counseling staff criterion is positively related to the short-term isolation rate in detention centers and training schools. One might expect that facilities which conform to this staffing criterion would be more focused on treatment and would use isolation less as a means of controlling juvenile behavior, but this does not appear to be the case.

Facility policies requiring a written report and placing a limit of 5 days on the length of isolation are both associated with lower short-term isolation rates, but this association is only statistically significant for detention centers, where reporting requirements are associated with a strong decrease in the isolation rate. Accreditation by ACA is also related to a decrease in the short-term isolation rate in detention centers.

The regression results for longer term isolation (over 24 hours) are presented in Table 8-3. Training schools that have a 12-foot wall or fence are likely to have higher long-term isolation rates,[9] suggesting that long-term isolation is used more frequently in facilities that emphasize security. Conformance to the security staff ratio is also positively related to the long-term isolation rate among detention centers,[10] again highlighting the relationship between security and isolation as a means of behavior control.

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[9] There is also a large but statistically insignificant coefficient for ranches. These results should be ignored, because they are driven by only a handful of cases. Ranches generally do not have these hardware security features.

[10] There are negative coefficients for training schools and ranches on this measure, but these coefficients are not significant, and are not significantly different from the detention center coefficient.

Table 8–3
Regression of Rate of Isolation Over 24 Hours on Facility Characteristics

Explanatory Variables	Regression Coefficients (standard error)			F tests				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Intercept	-12.565 (13.114)	38.384 (22.819)	3.108 (39.481)					
Percent male	0.009 (0.042)	-0.067 (0.156)	0.059 (0.112)	0.1685	0.2156	0.4272	0.1682	0.2235
Percent minority	-0.059 (0.064)	-0.012 (0.078)	-0.014 (0.204)	0.2699	0.1059	0.0001	0.0397	0.1984
Percent aged 16 or older	-0.005 (0.053)	0.200 (0.111)	-0.077 (0.110)	1.2443	1.8035	3.1227	0.3476	2.7753
Age range	2.674* (0.857)	0.109 (1.159)	-0.198 (1.657)	3.2540*	2.1837	0.0230	2.3698	3.1685
Percent serious offenses	-0.120 (0.073)	-0.010 (0.145)	-0.074 (0.428)	0.9165	0.2339	0.0199	0.0116	0.4647
Percent drug offenses	0.269 (0.191)	-0.511 (0.278)	-0.160 (0.489)	1.8168	2.7252	0.3900	0.6651	5.3308*
Population < 50 residents	1.014 (3.832)	4.728 (4.641)	-1.640 (8.853)	0.3808	0.2898	0.4059	0.0757	0.3809
Private	-8.063* (3.732)	5.177 (10.222)	-3.176 (9.735)	1.6773	0.7921	0.3502	0.2198	1.4805
West	-6.966 (3.473)	-0.827 (4.887)	1.827 (9.959)	1.3618	0.7356	0.0572	0.6950	1.0484
Northeast	-2.049 (3.591)	-16.752 (6.605)	-0.997 (12.653)	2.2545	1.9693	1.2184	0.0064	3.8244
Midwest	-0.006 (3.113)	-12.558 (4.761)	-1.698 (9.619)	2.3301	2.4565	1.0239	0.0280	4.8699*
Percent in dormitories	0.060 (0.034)	-0.312 (0.164)	0.029 (0.083)	2.2987	2.4762	3.4399	0.1201	4.9206*
Admissions per person-month	-6.767 (7.282)	-1.804 (1.079)	-1.130 (18.018)	1.2205	0.2283	0.0014	0.0842	0.4547
ACA accreditation	13.216* (3.301)	-16.578* (5.923)	(a)	11.9333*	19.3075*	(a)	(a)	19.3075*
Locked living units	-2.923 (2.501)	5.560 (4.558)	12.362 (17.539)	1.1168	1.6150	0.1409	0.7444	2.6619
12-foot wall or fence	9.619* (3.248)	2.755 (3.660)	56.704 (30.775)	4.2445*	2.3012	3.0301	2.3149	1.9677

Explanatory Variables	Regression Coefficients (standard error)			F tests				
	Training Schools	Detention Centers	Ranches	Any Effect	Differences by Facility Type			
					Any	DC=R	TS=R	DC=TS
Classification	1.438 (2.495)	-5.752 (3.961)	-3.140 (5.743)	0.9133	1.2654	0.1402	0.5342	2.3590
Security staff ratio criterion	-4.212 (2.599)	7.712* (3.379)	-4.485 (8.516)	2.7050*	4.0573*	1.7724	0.0009	7.8262*
Staff turnover rate	0.052 (0.071)	0.102 (0.086)	-0.037 (0.118)	0.6805	0.4516	0.9026	0.4101	0.2021
Counseling staff ratio criterion	-1.240 (5.161)	-7.927 (3.159)	-1.337 (8.534)	2.1261	0.7523	0.5244	0.0001	1.2209
Living unit size criterion	-0.233 (0.415)	0.677 (0.632)	1.194 (2.753)	0.5496	0.8096	0.0335	0.2627	1.4466
Facility exceeds design capacity	2.218 (2.225)	3.403 (3.367)	1.399 (7.636)	0.6828	0.0543	0.0577	0.0106	0.0861
Minimum room size criterion	0.287 (2.428)	-0.355 (3.186)	0.911 (6.864)	0.0147	0.0201	0.0280	0.0073	0.0257
Total search rate	-0.072 (0.050)	0.016 (0.044)	0.153 (0.715)	0.7532	0.9087	0.0365	0.0985	1.7575
Time limit criterion rate	-6.912 (3.519)	-24.732* (4.093)	0.689 (20.035)	13.4553*	5.7302*	1.5455	0.1397	10.8967*
Written report criterion	14.756 (8.785)	11.909 (6.098)	11.455 (25.547)	2.2789	0.0368	0.0003	0.0.149	0.0709

R-square = 33%   (a) = not applicable
DF = 452   * = differences are statistically significant at the .05 level
F = 3.663, p = .0001

The assessment criterion placing a 5-day limit on isolation is related to lower rates of longer term isolation in both detention centers and training schools.[11] Requiring a written report for the use of isolation does not have a significant effect on the use of longer term isolation, though it was significantly associated with less frequent short-term isolation.

In detention centers, ACA accreditation is also related to lower long-term isolation rates. The opposite is true for training schools, where accreditation is related to higher long-term isolation rates.

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[11] The coefficient for ranches is not significant, but it is also not significantly different from those for training schools and detention centers.

We examined the individual isolation rates for ACA accredited training schools and found that several of them have high rates of long-term isolation. These facilities appear to be causing this result.

Suicidal Behavior. Juveniles are most likely to attempt suicide just after entering a facility that reports very high turnover rates, creating higher rates of suicidal behavior in detention centers (see Chapter 5B). Although the estimated effect of turnover (measured here as the number of admissions per person-month) was not significant in the regression analysis, detention centers did not have a significantly higher rate of suicidal behavior than training schools once this measure of turnover was included in the model (Table 8-4).

Table 8–4
Regression of Suicidal Behavior Rate on Facility Characteristics

| Explanatory Variables | Regression Coefficients (standard error) | | | F test | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Intercept	2.650 (3.751)	-4.639 (7.923)	-0.668 (11.417)					
Percent male	-0.017 (0.014)	0.063 (0.044)	-0.017 (0.044)	1.2523	1.5316	1.6520	0.0001	3.0402
Percent minority	-0.010 (0.019)	-0.048* (0.023)	-0.011 (0.080)	1.5672	0.8550	0.1971	0.0003	1.6791
Percent aged 16 or older	-0.016 (0.016)	-0.002 (0.031)	0.005 (0.041)	0.3418	0.1757	0.0192	0.2379	0.1728
Age range	0.150 (0.269)	0.144 (0.302)	-0.191 (0.633)	0.3598	0.2791	0.1501	0.0290	0.5058
Percent serious offenses	-0.007 (0.024)	-0.041 (0.042)	0.019 (0.149)	0.2794	0.3938	0.0950	0.0306	0.7875
Percent drug offenses	0.042 (0.059)	-0.044 (0.077)	0.012 (0.164)	0.2104	0.1300	0.2291	0.2456	0.0002
Population < 50 residents	2.036 (1.284)	0.313 (1.266)	0.581 (2.901)	0.8714	0.4745	0.0071	0.2104	0.9124
Private	1.924 (1.329)	-0.407 (3.223)	0.756 (3.559)	0.7191	0.2479	0.0588	0.0944	0.4473
West	-0.649 (1.075)	-3.210* (1.513)	0.947 (3.851)	1.6422	1.1447	1.0098	0.1596	1.9026
Northeast	-1.897 (1.168)	1.623 (1.830)	2.381 (4.258)	1.2458	1.5930	0.0267	0.9391	2.6299
Midwest	-0.321 (1.012)	-1.209 (1.306)	-0.257 (3.189)	0.3214	0.1518	0.0764	0.0004	0.2890
Percent in single rooms	0.005 (0.010)	0.038* (0.013)	0.008 (0.045)	2.9960*	2.1128	0.4176	0.0039	4.1859*
Admissions per person-month	2.045 (2.282)	-0.182 (0.344)	-2.284 (7.729)	0.3899	0.5040	0.0738	0.2885	0.9307
ACA accreditation	-0.799 (1.126)	-1.846 (1.594)	(a)	0.9230	0.2876	(a)	(a)	0.2876
Locked living units	1.233 (0.826)	1.532 (1.402)	0.766 (7.109)	1.1447	0.0198	0.0112	0.0043	0.0337
12-foot wall or fence	0.964 (0.985)	2.540* (1.051)	2.537 (14.786)	2.2764	0.6004	0.0000	0.0113	1.1977
Classification	0.163 (0.773)	1.159 (1.185)	-0.000 (2.382)	0.3339	0.2651	0.1899	0.0043	0.4954

Explanatory Variables	Regression Coefficients (standard error)			F test				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Security staff ratio criterion	-0.832 (0.835)	-3.072* (1.013)	-0.336 (3.126)	3.3975*	1.5509	0.6930	0.0235	2.9089
Staff turnover rate	0.007 (0.025)	0.106* (0.030)	0.009 (0.048)	4.2696*	3.5010*	2.9218	0.0006	6.4257*
Counseling staff ratio criterion	-1.994 (1.640)	0.347 (0.965)	-0.201 (2.662)	0.5378	0.7572	0.0375	0.3298	1.5139
Living unit size criterion	0.136 (0.136)	0.231 (0.165)	-0.291 (0.987)	1.0127	0.2086	0.2724	0.1838	0.1969
Facility exceeds design capacity	0.426 (0.772)	3.668* (0.990)	0.243 (2.593)	4.6822*	3.4750*	1.5233	0.0046	6.6697*
Minimum room size criterion	0.260 (0.739)	-0.949 (0.982)	0.419 (2.482)	0.3621	0.5112	0.2628	0.0038	0.9677
Total search rate	-0.002 (0.018)	-0.005 (0.013)	0.057 (0.230)	0.0837	0.0444	0.0740	0.0671	0.0171
Short-term isolation rate	0.001 (0.005)	0.005 (0.003)	-0.034 (0.210)	1.2631	0.4557	0.0359	0.0270	0.8783
Long-term isolation rate	-0.000 (0.024)	-0.030 (0.018)	0.032 (0.175)	0.9862	0.5347	0.1253	0.0337	0.9818
Suicide prevention plan	1.494 (1.222)	2.417 (2.198)	0.443 (2.632)	0.9103	0.1670	0.3312	0.1312	0.1345
Suicide screening	0.433 (0.763)	-6.373* (1.456)	-0.578 (2.140)	6.5177*	8.5916*	5.0114*	0.1982	17.1421*
Staff training	0.091 (0.752)	-4.744* (1.005)	-0.771 (2.243)	7.4677*	7.4857*	2.6113	0.1330	14.8301*
Monitoring suicide risks	0.321 (0.837)	0.694 (0.903)	-0.784 (2.953)	0.3258	0.3457	0.5305	0.0197	0.6739

R-square = 21%   (a) = not applicable
DF = 525   * = differences are statistically significant at the .05 level
F = 2.551, p = .0001

The percentage of juveniles housed in single rooms is associated with an increase in the rate of suicidal behavior among juveniles in detention centers.[12] Juveniles who are isolated in individual rooms at night (and sometimes part of each day as well) are provided with periods when they are not observed or in close physical proximity to other people. Although the coefficient for this variable appears to be small, it is based upon the percentage of juveniles. A 25 percent increase in the percentage of juveniles housed in single rooms translates into a .95 increase in the rate of suicidal behavior. Compared to the overall rate for detention centers, which is 4.59 (see Chapter 5B), this increase is sizeable.

The apparent association between suicidal behavior and single rooms does not warrant a general condemnation of single rooms. Our finding suggests only that juveniles who are believed to be at risk for suicide should not be placed in rooms by themselves. To achieve this, facilities that house juveniles in single rooms typically assign a staff member to stay with a suicidal youth any time they are in a single room.

Detention centers that are operating above their design capacity have higher rates of suicidal behavior.[13] Such facilities may be overwhelmed by the number of admissions, and resources such as staff attention may be overtaxed, leading to greater opportunities for suicidal behavior.

Staffing issues appear to be very important in the prevention of suicidal behavior. Detention centers that meet the recommended security staff ratio have lower rates of suicidal behavior, and the rate of turnover among security staff is associated with an increase in the rate of that behavior.[14] This suggests that having an adequate number of staff improves supervision and that experienced staff may be better able to identify potentially suicidal residents and intervene effectively. Training in suicide prevention may help new staff improve their ability to recognize warning signs and take the appropriate actions.

Suicide screening upon admission and staff training in suicide prevention are related to lower suicidal behavior rates in detention centers, suggesting that staff are at least somewhat successful in being identifying suicide risks when they enter the facility and that training helps in that identification process. Having a written suicide prevention plan and requiring staff to monitor isolated juveniles are not related to the suicidal behavior rate. While facility policy requiring staff to directly monitor isolated juveniles continuously does not appear to significantly reduce the suicidal behavior rate, it may be very important in reducing completed suicides, because many times it may be implemented after an attempt is recognized. During one site visit, a juvenile tried to commit suicide by hanging and was found in time due to a policy requiring direct monitoring.

Juvenile-on-Juvenile Injuries. Having a 12-foot wall or fence is positively associated with the juvenile-on-juvenile injury rate among training schools (Table 8–5).[15] Even after controlling for the percentage of juveniles held for violent offenses, we find an effect for hardware security; this suggests that we have been

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[12] There is a positive association for all three facility types, but it is significant only for detention centers, and the coefficients for detention centers and training schools are significantly different from one another.

[13] There is a positive association for all three facility types, but it is significant only for detention centers, and the coefficients for detention centers and training schools are significantly different from one another.

[14] These relationships hold for all three facility types. In the case of the staffing criterion, detention centers are not significantly different from the other two facility types. In the case of staff turnover, the coefficient for detention centers is significantly different from that for training schools.

[15] There is also a positive association for detention centers, which is not significantly different from that for training schools. Again, the estimate for ranches is unreliable and should be ignored.

unable to measure either some attribute of the juvenile population, the facility environment, or both, which are related to a hardware secure facility.

Table 8–5
Regression of Rate of Juvenile-on-Juvenile Injuries on Facility Characteristics

Explanatory Variables	Regression Coefficients (standard error)			F tests				
	Training Schools	Detention Centers	Ranches	Any Effect	Differences by Facility Type			
					Any	DC=R	TS=R	DC=TS
Intercept	1.814 (2.870)	-6.484 (5.369)	2.877 (11.833)					
Percent male	0.037* (0.014)	0.024 (0.044)	0.002 (0.041)	2.4188	0.3582	0.1349	0.6743	0.0824
Percent minority	0.059* (0.018)	0.041 (0.023)	0.019 (0.075)	4.5250*	0.2718	0.0805	0.2659	0.3586
Percent aged 16 or older	-0.076* (0.017)	-0.001 (0.030)	-0.014 (0.041)	6.9386*	2.8504	0.0585	1.9543	4.6501*
Age range	0.724* (0.262)	0.148 (0.302)	-0.262 (0.584)	2.6970*	1.7590	0.3889	2.3759	2.0826
Percent serious offenses	-0.047* (0.022)	-0.003 (0.040)	-0.081 (0.142)	1.5805	0.5031	0.2757	0.0537	0.9129
Percent drug offenses	-0.054 (0.055)	0.048 (0.072)	0.093 (0.171)	0.5730	0.8318	0.0603	0.6792	1.2719
Population < 50 residents	1.681 (1.260)	-0.012 (1.259)	-1.015 (3.023)	0.6309	0.6239	0.0938	0.6776	0.9037
Private	-0.114 (1.187)	-0.260 (3.209)	-0.230 (3.422)	0.0068	1.2240	0.0036	0.3976	2.3027
West	-4.231* (1.070)	-1.555 (1.402)	-1.792 (3.716)	5.6969*	2.4134	0.3889	1.9660	3.2528
Northeast	-4.387* (1.133)	0.405 (1.786)	0.992 (4.328)	5.0355*	2.9742	0.0157	0.4451	5.1323*
Midwest	-1.882 (1.009)	1.403 (1.263)	1.435 (3.177)	1.6391	2.2584	0.0001	0.9897	4.1296*
Percent in dormitories	0.030* (0.010)	-0.044 (0.040)	-0.014 (0.029)	3.2422*	0.0013	0.0000	0.0010	0.0018
Admissions per person-month	0.129 (2.187)	-0.185 (0.341)	-3.006 (6.254)	0.1763	0.1120	0.2028	0.2239	0.0202
ACA accreditation	-0.302 (1.112)	3.685 (1.520)	(a)	2.9750	4.4801*	(a)	(a)	4.4801*
Locked living units	1.717* (0.825)	1.935 (1.352)	-2.503 (7.010)	2.1684	0.1939	0.3864	0.3575	0.0189

Table 8–5
Regression of Rate of Juvenile-on-Juvenile Injuries on Facility Characteristics
Continued

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
12-foot wall or fence	2.776* (0.987)	1.014 (1.030)	-1.940 (14.434)	2.9675*	1.7989	0.0417	0.1063	1.5259
Classification	-0.863 (0.779)	1.505 (1.167)	0.477 (2.059)	0.9811	0.4635	0.1884	0.3702	2.8468
Security staff ratio criterion	-0.971 (0.812)	0.188 (1.013)	0.168 (2.929)	0.4898	0.4248	0.0000	0.1405	0.7971
Staff turnover rate	0.029 (0.023)	0.012 (0.030)	0.030 (0.041)	0.7593	0.1142	0.1283	0.0010	0.1989
Counseling staff ratio criterion	-2.479 (1.546)	-0.501 (0.918)	-0.268 (2.850)	0.9591	0.6366	0.0061	0.4648	1.2091
Living unit size criterion	-0.005 (0.149)	0.073 (0.173)	-1.200 (3.016)	0.1128	0.1407	0.1777	0.1568	0.1157
Facility exceeds design capacity	0.821 (0.734)	-1.963 (1.008)	-0.465 (2.737)	1.6913	2.4995	0.2638	0.2059	4.9859*
Minimum room size criterion	-0.435 (0.716)	1.264 (0.935)	0.991 (2.332)	0.7925	1.0960	0.0118	0.3418	2.0814
Total search rate	-0.047* (0.017)	0.001 (0.013)	0.023 (0.248)	2.5313	2.5555	0.0073	0.0778	5.0866*
Short-term isolation rate	-0.009* (0.005)	-0.002 (0.003)	0.106 (0.202)	1.5603	0.9256	0.2849	0.3217	1.5550
Long-term isolation rate	-0.001 (0.025)	0.017 (0.018)	-0.029 (0.196)	0.3007	0.1886	0.0538	0.0197	0.3371

R-square = 15%   (a) = not applicable
DF = 545   * = differences are statistically significant at the .05 level
F = 2.253, p = .0001

Living in dorms is positively associated with an increased injury rate, as expected: Higher social density increases the chance that violence will occur. However, this association was found to be significant only among training schools.[16]

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[16] An estimated negative association also exists for detention centers and ranches, but these coefficients are neither significant nor significantly different from the coefficient for training schools.

Staff-on-Juvenile Injuries. Staff-on-juvenile injuries are rare, and as a result our model explains only 1 percent of the variation in this rate (Table 8–6). The staff-on-juvenile injury rate is associated with increases in the number of admissions per person-month in detention centers[17] and with an increase in staff turnover in training schools. During several site visits to detention centers, staff cited juveniles' short duration of confinement as a challenge in performing their jobs. They stated that it was difficult to get to know and understand residents during their brief stays in the facility. Many staff relied on such knowledge when handling juveniles' behavioral or emotional problems.

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[17] There is a positive effect for training schools and a negative effect for ranches, but no significant difference between the three coefficients.

Table 8-6
Regression of Staff-on-Juvenile Injuries on Facility Characteristics

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Intercept	0.573 (0.444)	-1.267 (0.771)	-1.521 (1.456)					
Percent male	-0.004 (0.002)	0.003 (0.006)	-0.000 (0.005)	1.2747	0.6729	0.1421	0.3651	0.1421
Percent minority	0.004 (0.002)	0.002 (0.003)	0.008 (0.009)	1.0903	0.2401	0.3888	0.2044	0.1940
Percent aged 16 or older	-0.000 (0.002)	0.005 (0.004)	0.001 (0.005)	0.6228	0.8199	0.5128	0.0364	1.6389
Age range	0.041 (0.035)	0.037 (0.039)	-0.011 (0.077)	0.7526	0.1896	0.3028	0.3701	0.0056
Percent serious offenses	-0.001 (0.003)	-0.001 (0.005)	-0.004 (0.018)	0.0865	0.0159	0.0304	0.0235	0.0062
Percent drug offenses	-0.014 (0.007)	-0.015 (0.009)	-0.000 (0.022)	2.0870	0.1888	0.3624	0.3438	0.0051
Population < 50 residents	0.091 (0.160)	-0.017 (0.164)	0.044 (0.384)	0.1145	0.1100	0.0215	0.0124	0.2198
Private	0.259 (0.153)	-0.011 (0.402)	0.323 (0.441)	1.1421	0.8003	0.3135	0.0186	0.3956
West	-0.168 (0.138)	-0.358 (0.182)	0.197 (0.441)	1.8438	0.4377	1.3517	0.6252	0.6885
Northeast	-0.077 (0.147)	-0.104 (0.228)	0.440 (0.550)	0.3737	1.3781	0.8331	0.8233	0.0098
Midwest	-0.054 (0.131)	-0.128 (0.162)	0.584 (0.398)	0.9792	0.2200	2.7363	2.3135	0.1231
Percent in dormitories	-0.001 (0.001)	-0.001 (0.005)	-0.002 (0.004)	0.2061	0.0317	0.0024	0.0528	0.0142
Admissions per person-month	0.505 (0.289)	0.123* (0.044)	-0.374 (0.835)	3.7305*	1.0375	0.3536	0.9901	1.7090
ACA accreditation	-0.140 (0.149)	0.224 (0.200)	(a)	1.0681	2.1302	(a)	(a)	2.1302
Locked living units	0.218* (0.107)	-0.265 (0.175)	0.875 (2.854)	2.1839	2.8124	0.1590	0.0530	5.5485*
12-foot wall or fence	-0.034 (0.124)	-0.002 (0.133)	1.089 (4.150)	0.0481	0.0511	0.0690	0.0731	0.0309

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Explanatory Variables	Regression Coefficients (standard error)			F tests				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Classification	0.023 (0.101)	0.089 (0.151)	-0.147 (0.267)	0.2331	0.2967	0.5910	0.3562	0.1306
Security staff ratio criterion	-0.101 (0.103)	0.103 (0.134)	0.294 (0.376)	0.7206	1.0723	0.2278	1.0254	1.4578
Staff turnover rate	0.007* (0.003)	-0.001 (0.004)	-0.001 (0.006)	1.6536	1.5306	0.0197	1.7143	2.2854
Counseling staff ratio criterion	-0.300 (0.194)	-0.058 (0.119)	-0.059 (0.416)	0.8822	0.5786	0.0000	0.2759	1.1341
Living unit size criterion	-0.001 (0.017)	0.021 (0.022)	0.056 (0.290)	0.3131	0.3362	0.0147	0.0391	0.6437
Facility exceeds design capacity	0.030 (0.096)	-0.028 (0.136)	-0.063 (0.378)	0.0558	0.0790	0.0077	0.0572	0.1214
Minimum room size criterion	0.057 (0.090)	-0.156 (0.123)	0.114 (0.296)	0.7215	1.0718	0.7082	0.0037	1.9569
Total search rate	-0.002 (0.002)	0.001 (0.002)	0.001 (0.036)	0.3337	0.4896	0.0001	0.0049	0.9788
Short-term isolation rate	-0.000 (0.001)	0.000 (0.000)	-0.014 (0.058)	0.0420	0.0613	0.0586	0.0572	0.0644
Long-term isolation rate	-0.001 (0.003)	0.003 (0.002)	-0.015 (0.039)	0.5760	0.5525	0.2122	0.1299	0.9242
Restraints criterion	-0.349* (0.175)	-0.099 (0.222)	-0.032 (0.442)	1.3862	0.5034	0.0180	0.4428	0.7798
Use of force criterion	-0.026 (0.189)	0.290 (0.236)	0.221 (0.478)	0.5806	0.5784	0.0168	0.2314	1.0952

R-square = 1%   (a) = not applicable
DF = 523   * = differences are statistically significant at the .05 level
F = 1.048, p = .3759

Conformance to the criteria on the use of force and the use of restraints is not significantly related to the staff-on-juvenile injury rate.

Juvenile-on-Staff Injuries

Training schools that operate over their design capacity have higher rates of juvenile-on-staff injuries (Table 8-7).[18]

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[18] There is a negative effect for ranches and a small positive effect for detention centers. The difference between coefficients is significant for detention centers and training schools but not for training schools and ranches.

Table 8-7
Regression of Juvenile-on-Staff Injuries on Facility Characteristics

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Intercept	-0.399 (2.263)	0.674 (3.858)	2.810 (8.576)					
Percent male	-0.017 (0.009)	0.006 (0.029)	0.014 (0.027)	1.2494	0.8277	0.0383	1.2159	0.5960
Percent minority	0.022 (0.013)	0.003 (0.015)	0.075 (0.050)	1.7554	1.2093	1.9317	1.0812	0.9510
Percent aged 16 or older	-0.005 (0.011)	0.017 (0.020)	-0.025 (0.031)	0.5455	0.7769	1.2917	0.3562	0.9877
Age range	0.447* (0.178)	0.085 (0.191)	-0.318 (0.384)	2.3994	2.0425	0.8833	3.2656	1.9154
Percent serious offenses	-0.028 (0.015)	0.003 (0.025)	-0.155 (0.095)	2.0945	1.5555	2.5789	1.7294	1.1398
Percent drug offenses	0.013 (0.036)	0.000 (0.046)	-0.022 (0.112)	0.0546	0.0560	0.0344	0.0869	0.0440
Population < 50 residents	0.741 (0.799)	-0.649 (0.816)	-2.221 (1.918)	0.9451	1.3916	0.5689	2.0335	1.4823
Private	0.275 (0.766)	1.753 (2.002)	-0.053 (2.299)	0.2985	0.0965	0.0265	0.1031	0.1215
West	-1.564* (0.697)	-1.166 (0.904)	-0.736 (2.481)	2.2600	0.2841	0.3347	0.5377	0.0142
Northeast	-1.968* (0.731)	-0.963 (1.134)	-0.475 (2.794)	2.6619*	0.3644	0.0262	0.2669	0.5538
Midwest	-0.898 (0.656)	-0.653 (0.808)	1.423 (2.017)	1.0093	0.5994	0.9131	1.1983	0.5555
Percent in dormitories	-0.140* (0.006)	-0.011 (0.025)	-0.029 (0.020)	2.3822	0.2601	0.3508	0.0183	0.4755
Admissions per person-month	-2.972* (1.447)	0.095 (0.217)	-0.389 (4.229)	1.4728	2.2020	0.0131	0.3338	4.3943*
ACA accreditation	-0.923 (0.743)	-0.378 (0.994)	(a)	0.8437	0.1931	(a)	(a)	0.1931*
Locked living units	1.364* (0.533)	-0.247 (0.868)	10.028 (22.045)	2.2834	1.3367	0.2169	0.1544	2.5030
12-foot wall or fence	1.027 (0.619)	-0.347 (0.661)	11.382 (47.774)	1.0262	1.1756	0.0603	0.0470	2.2982

Explanatory Variables	Regression Coefficients (standard error)			F tests				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Classification	-0.025 (0.506)	0.998 (0.753)	-1.378 (1.352)	0.9328	1.3327	2.3568	0.8786	1.2721
Security staff ratio criterion	-0.075 (0.515)	-0.471 (0.657)	-1.095 (1.975)	0.2807	0.2055	0.0899	0.2497	0.2251
Staff turnover rate	0.023 (0.016)	0.014 (0.019)	0.068* (0.029)	2.6679*	1.2330	2.3604	1.8512	0.1108
Counseling staff ratio criterion	-0.221 (0.973)	-0.358 (0.589)	0.119 (2.124)	0.1416	0.0276	0.0469	0.0213	0.0145
Living unit size criterion	0.050 (0.083)	-0.065 (0.109)	0.923 (2.110)	0.3060	0.4504	0.2188	0.1708	0.7127
Facility exceeds design capacity	1.055* (0.482)	-1.123 (0.648)	2.560 (1.934)	3.1829*	4.3035*	3.2622	0.5708	7.2703*
Minimum room size criterion	1.045* (0.457)	-0.466 (0.605)	1.143 (1.508)	2.1300	2.0736	0.9806	0.0039	3.9729*
Total search rate	-0.023* (0.011)	-0.006 (0.008)	0.008 (0.204)	1.4730	0.7381	0.0045	0.0226	1.4668*
Short-term isolation rate	-0.006* (0.003)	0.004 (0.002)	0.014 (0.840)	2.5975	3.8427*	0.0002	0.0006	7.6851*
Long-term isolation rate	-0.015 (0.016)	0.006 (0.012)	-0.379 (0.246)	1.1600	1.7087	2.4416	2.1833	1.0667
Restraints criterion	1.435 (0.970)	-0.607 (1.104)	-1.821 (2.246)	1.0500	1.4683	0.2353	1.7715	1.9323
Use of force criterion	-0.095 (0.939)	0.602 (1.175)	1.061 (2.422)	0.1547	0.1684	0.0291	0.1981	0.2146

R-square = 10%
DF = 520
F = 1.647, p = .0008

(a) = not applicable
* = differences are statistically significant at the .05 level

While none of the assessment criteria on staffing ratios or policies are associated with the juvenile-on-staff injury rate, the supervision staff turnover rate is associated with a higher rate. Newer staff may be more likely to be injured by juveniles due to their inexperience in crisis management. Alternatively, high staff turnover may result when rates of juvenile and staff assaults are high. It is not possible to untangle the causality of the relationship in this model.

Attempted Escapes

Having locked living units appears to deter juveniles from attempting to escape from training schools.[19] However, conforming to the counts criterion (which recommends three institutional counts per day) does not appear to deter juveniles from attempted escapes, once we control for hardware security in the regression model (Table 8-8).

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[19] There is also a negative, nonsignificant relationship for detention centers, but the difference between the training school and detention center coefficients is not significant. The coefficient for ranches should be ignored.

Explanatory Variables	Regression Coefficients (standard error)			F tests				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Intercept	2.228 (2.755)	2.189 (5.080)	-3.256 (9.734)					
Percent male	0.034* (0.014)	-0.053 (0.042)	0.045 (0.037)	3.1326*	2.0550	3.0326	0.0739	3.8778*
Percent minority	0.007 (0.017)	-0.002 (0.020)	0.070 (0.069)	0.3985	0.5003	0.9821	0.7638	0.1219
Percent aged 16 or older	-0.061* (0.015)	0.005 (0.028)	-0.031 (0.037)	5.4320*	2.2130	0.6024	0.5401	4.3015*
Age range	-0.052 (0.235)	0.398 (0.273)	0.263 (0.548)	0.8032	0.8047	0.0489	0.2792	1.5639
Percent serious offenses	-0.002 (0.021)	-0.053 (0.036)	-0.403* (0.140)	3.4912*	4.5435*	5.9006*	8.0646*	1.4971
Percent drug offenses	0.044 (0.049)	-0.063 (0.066)	-0.140 (0.159)	0.8214	1.2288	0.1947	1.2075	1.6783
Population < 50 residents	0.406 (1.169)	0.770 (1.124)	-0.700 (2.882)	0.2161	0.1187	0.2258	0.1265	0.0503
Private	0.805 (1.118)	8.998* (2.900)	-5.017 (3.096)	4.2564*	5.6926*	10.9148*	3.1289	6.9481*
West	-0.590 (0.093)	-0.642 (1.273)	7.717* (2.978)	2.4480	3.6647*	6.6614*	7.0437*	0.0011
Northeast	-1.395 (1.051)	1.240 (1.609)	9.665* (3.838)	2.8992*	4.3427*	4.0979*	7.7247*	1.8803
Midwest	-0.932 (0.897)	0.377 (1.151)	7.034* (3.010)	2.2160	3.3218	4.2670*	6.4323*	0.8056
Percent in dormitories	0.001 (0.009)	-0.005 (0.036)	-0.066* (0.030)	1.6226	2.2718	1.6919	4.5437*	0.0249
Admissions per person-month	-2.521 (1.991)	-0.052 (0.304)	10.224 (5.701)	1.6159	2.3888	3.2394	4.4540*	1.5026
ACA accreditation	-0.867 (1.029)	-0.351 (1.359)	(a)	0.3879	0.0916	(a)	(a)	0.0916
Locked living units	-2.145* (0.751)	-0.353 (1.212)	6.233 (17.456)	2.7867*	0.8914	0.1417	0.2299	1.5793
12-foot wall or fence	-1.640 (0.936)	-0.034 (0.931)	28.748 (25.013)	1.4637	1.4386	1.3222	1.4739	1.4795

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Classification	-0.456 (0.723)	-0.618 (1.042)	-0.441 (1.923)	0.2672	0.0087	0.0065	0.0001	0.0163
Security staff ratio criterion	0.063 (0.734)	-0.085 (0.922)	-1.148 (2.683)	0.0662	0.0961	0.1404	0.1894	0.0156
Staff turnover rate	0.026 (0.021)	0.010 (0.026)	-0.003 (0.039)	0.5428	0.2594	0.0796	0.4364	0.2236
Counseling staff ratio criterion	3.574* (1.420)	0.610 (0.835)	5.223 (2.712)	3.5235*	2.5597	2.6416	0.2900	3.2358
Living unit size criterion	-0.102 (0.128)	0.088 (0.147)	0.341 (1.791)	0.3423	0.4947	0.0198	0.0608	0.9490
Facility exceeds design capacity	1.782* (0.662)	-0.760 (0.914)	-0.782 (2.478)	2.6755*	2.7568	0.0001	0.9993	5.0700*
Minimum room size criterion	-1.301* (0.652)	0.672 (0.824)	-4.407* (2.201)	2.8853*	3.2281*	4.6700*	1.8299	3.5297
Total search rate	0.010 (0.016)	0.001 (0.012)	-0.117 (0.217)	0.2435	0.2794	0.2934	0.3429	0.2470
Short-term isolation rate	-0.003 (0.004)	0.001 (0.003)	-0.312 (0.356)	0.4380	0.6461	0.7750	0.7574	0.5226
Long-term isolation rate	-0.001 (0.023)	0.013 (0.016)	-0.317 (0.234)	0.8336	1.0862	1.9730	1.8011	0.2517
Counts criterion	0.053 (0.828)	0.167 (1.204)	-1.891 (2.226)	0.2482	0.3648	0.6615	0.6696	0.0061

R-square = 18%
DF = 528
F = 2.447, p = .0001

(a) = not applicable
* = differences are statistically significant at the .05 level

The association between crowding and the attempted escape rate is murky. We find that conformance to the design capacity criterion is associated with a higher attempted escape rate in training schools, while conformance to the sleeping room square footage criterion is associated with a lower attempted escape rate in training schools and ranches. Any possible explanations of these findings would be mere conjecture.

Escapes

Only one of our conformance criteria is related to the escape rate. Having locked living units is associated with a decrease in the escape rate among training schools. Having adequate space in sleeping rooms is associated with a decrease in the escape rate in ranches.[20] This finding, presented in Table 8-9, is consistent with that for the attempted escape rate, but is no less difficult to interpret.

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[20] This relationship is also negative for training schools but not significant. The coefficients for training schools and ranches are significantly different from one another.

Table 8-9
Regression of Successful Escape Rate on Facility Characteristics

Explanatory Variables	Regression Coefficients (standard error)			F tests				
					Differences by Facility Type			
	Training Schools	Detention Centers	Ranches	Any Effect	Any	DC=R	TS=R	DC=TS
Intercept	2.272 (1.859)	1.890 (3.439)	-8.583 (6.592)					
Percent male	0.019* (0.009)	-0.024 (0.029)	0.084* (0.025)	5.2326*	4.3368*	7.9637*	5.8427*	2.0223
Percent minority	0.013 (0.011)	-0.006 (0.014)	0.047 (0.046)	0.8148	0.9099	1.1808	0.5125	1.0414
Percent aged 16 or older	-0.041* (0.010)	-0.009 (0.019)	-0.044 (0.025)	6.5165*	1.2250	1.2829	0.0144	2.2922
Age range	-0.066 (0.158)	0.096 (0.185)	0.118 (0.372)	0.1813	0.2654	0.0027	0.2067	0.4436
Percent serious offenses	-0.009 (0.014)	-0.004 (0.024)	-0.298* (0.095)	3.4328*	4.6239*	9.0004*	9.0985*	0.0248
Percent drug offenses	0.016 (0.034)	-0.012 (0.045)	-0.125 (0.108)	0.5404	0.8082	0.9379	1.5439	0.2356
Population < 50 residents	1.509 (0.785)	0.138 (0.764)	-0.068 (1.958)	1.2411	0.8745	0.0096	0.5589	1.5647
Private	-0.148 (0.759)	4.549* (1.970)	-6.101* (2.046)	4.7549*	7.0664*	14.0622*	7.4448*	4.9505*
West	0.066 (0.654)	-0.352 (0.864)	7.262* (2.023)	4.3523*	6.2578*	1.9755*	11.4508*	0.1493
Northeast	-0.753 (0.711)	-0.408 (1.093)	5.772* (2.579)	2.0901	2.9793	4.8682*	5.9505*	0.0701
Midwest	-0.248 (0.606)	-0.280 (0.781)	5.647* (2.027)	2.6851	4.0203*	7.4440*	7.7611*	0.0010
Percent in dormitories	-0.001 (0.006)	-0.002 (0.025)	-0.051* (0.020)	2.1573	2.7753	2.3894	5.5289*	0.0009
Admissions per person-month	-0.529 (1.348)	-0.004 (0.206)	9.209* (3.868)	1.9405	2.9095	5.6557*	5.6505*	0.1482
ACA accreditation	-0.790 (0.697)	-0.465 (0.924)	(a)	0.7679	0.0788	(a)	(a)	0.0788
Locked living units	-1.169* (0.509)	-0.887 (0.822)	9.004 (11.863)	2.3359	0.4040	0.6918	0.7339	0.0849
12-foot wall or fence	-0.932 (0.635)	0.168 (0.633)	30.670 (16.946)	1.8324	2.4287	3.2355	3.4728	1.5024
Classification	-0.404 (0.487)	-0.237 (0.708)	-0.114 (1.302)	0.2696	0.0340	0.0069	0.0435	0.0379

Table 8–9
Regression of Successful Escape Rate on Facility Characteristics
Continued

| Explanatory Variables | Regression Coefficients (standard error) | | | F tests | | | | |
| | Training Schools | Detention Centers | Ranches | Any Effect | Differences by Facility Type | | | |
					Any	DC=R	TS=R	DC=TS
Security staff ratio criterion	-0.363 (0.496)	-0.254 (0.627)	-2.776 (1.823)	1.0060	0.8765	1.7114	1.6312	0.0186
Staff turnover rate	0.011 (0.014)	0.003 (0.018)	0.039 (0.026)	0.9641	0.6731	1.3019	0.9445	0.0981
Counseling staff ratio criterion	1.082 (0.957)	0.027 (0.567)	4.528* (1.843)	2.4390	2.9072	5.4481	2.7530	0.8999
Living unit size criterion	-0.013 (0.086)	0.043 (0.100)	1.400 (1.218)	0.5117	0.7414	1.2332	1.3409	0.1847
Facility exceeds design capacity	0.622 (0.449)	0.023 (0.621)	0.522 (1.678)	0.6708	0.3071	0.0779	0.0033	0.6103
Minimum room size criterion	-0.640 (0.441)	0.324 (0.559)	-4.244* (1.461)	3.6278*	4.4187*	8.5282	5.5770*	1.8330
Total search rate	0.010 (0.011)	0.002 (0.008)	-0.078 (0.148)	0.3852	0.3397	0.2922	2.0297	0.0516
Short-term isolation rate	-0.002 (0.003)	-0.001 (0.002)	-0.345 (0.241)	0.8385	1.0439	2.0389	2.0297	0.0516
Long-term isolation rate	0.002 (0.015)	0.007 (0.011)	-0.338* (0.159)	1.6569	2.3644	4.6895*	4.5245*	0.0807
Counts criterion	0.433 (0.561)	-0.266 (0.818)	0.270 (1.495)	0.2449	0.2492	0.0990	0.0104	0.4969

R-square = 16%
DF = 534
F = 2.209, p = .0001

(a) = not applicable
* = differences are statistically significant at the .05 level

Summary Regarding Predicting Outcome

The explanatory power of our models is modest at best. While we are able to explain 62 percent of the variance in short-term isolation and 35 percent of the variance in long-term isolation, we are unable to explain even 25 percent of the variation in the outcome measures of greatest interest: injury rates, suicidal behavior, and attempted and completed escapes.

Even if all facilities had the same underlying rates of escape, violence, or suicidal behavior, we would expect some variation in observed rates due to chance variations in the juvenile population or the timing of events in a given month. It appears, however, that the variation in rates across facilities is

much larger than would be accounted for by such chance fluctuations. The relatively low R-square of the regressions reflects the fact that our models do not measure all of the relevant predictive information.

We have identified some interesting patterns. Crowding is associated with higher rates of juvenile-on-staff injuries and suicidal behavior and with increased reliance upon isolation under 24 hours. The percentage of juveniles housed in dorms is associated with higher rates of juvenile-on-juvenile injuries. Both spatial density and social density appear to be related to increases in injury rates.

Conformance to the supervision staffing ratio assessment criterion was not associated with the injury rates. Conformance with this criterion was related to higher rates of long-term isolation, suggesting that facilities with higher staffing ratios also relied upon measures such as isolation to control juvenile behavior. Conformance with the staffing criterion was also related to a decrease in the rate of suicidal behavior.

The supervision staff turnover rate was associated with the suicidal behavior rate and the juvenile-on-staff injury rate. Higher turnover leads to a greater percentage of "rookie" staff, who may not be as adept as veteran staff in identifying potential suicide risks or avoiding injuries during crisis management. Also, higher rates of juvenile-on-staff injuries may lead to staff members quitting their positions.

The juvenile-on-juvenile and juvenile-on-staff injury rates are higher in facilities which lock living units at all times. Locking juveniles in a contained area appears to increase the amount of violence. This interpretation is consistent with our findings for crowding and the percentage of juveniles in dorms. However, having locked living units is also related to lower attempted and completed escape rates. If juveniles cannot leave their living unit without specifically being let out, it is difficult to escape, regardless of the hardware security outside of the building. These findings suggest a difficult trade-off: Locking living units appears to improve perimeter security but at the cost of maintaining order within the facility.

Placing juveniles in single rooms is associated with an increase in suicidal behavior. Isolation provides juveniles with the opportunity for self-harm. Conformance to the suicide screening assessment criterion is associated with a decrease in the suicidal behavior rate, suggesting that increased awareness when a juvenile enters the facility may help staff prevent incidents. During one site visit, we observed an experienced staff member skillfully calming a distraught youth while conducting suicide screening during an admission interview. Conformance to the staff training criterion is also associated with a decrease in the suicidal behavior rate, suggesting that training helps staff identify suicide risks and intervene in an appropriate manner.

Several other assessment criteria are also related to decreases in the outcome rates of interest. Conformance to the criterion limiting the amount of time spent in isolation is related to a decrease in isolation for periods under and over 24 hours. Conformance to the criterion requiring a written report for all uses of isolation is related to a decrease in the rate of isolation under 24 hours. Similarly, the criterion requiring a written report for all uses of restraints is related to a decrease in the rate of staff-on-juvenile injuries.